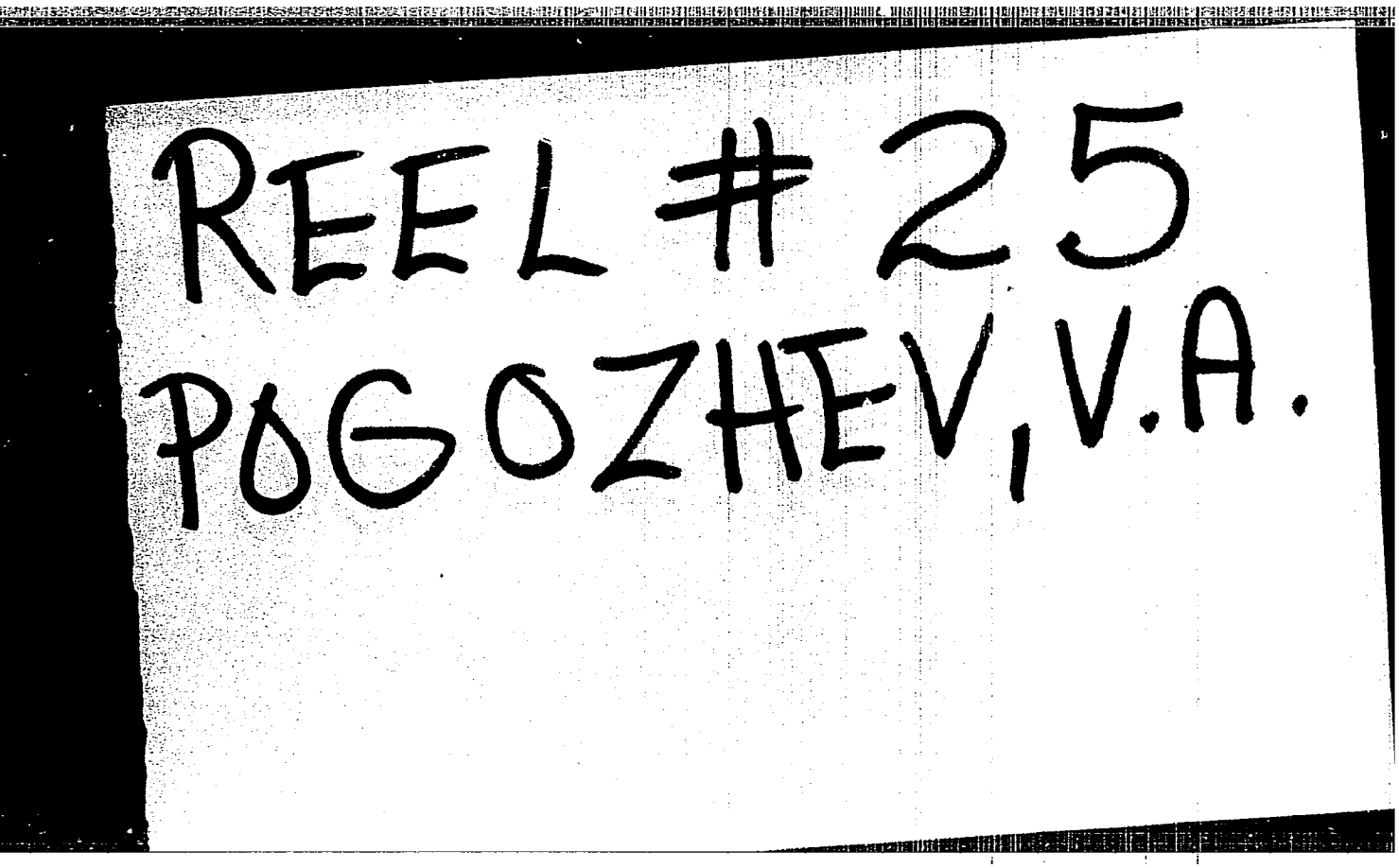

USSR

UDC: 538.61

KOLOTOV, O. S., LOBACHEV, M. I., and POGOZHEV, V. A.

"Stroboscopic Magnetooptical Device for Studying Polarity Reversal of Magnetic Tape"

Moscow, Pribory i tekhnika eksperimenta, No 1, 1973, pp 218-220

Abstract: The purpose of the equipment described in this paper is to observe the dynamic domains and to measure the integral pulse characteristics of magnetic tape. A block diagram of the device is shown; the magnetic-optical Kerr effect is used for observation of the domains, and the film being investigated moves through a magnetic field reversing device consisting of an M-shaped form and an erase winding. Photographs of the domains, obtained for films 1200 Å thick in a magnetic field intensity of four oersteds, are reproduced to show the formation of the edge domains and their spread to the central regions of the tape. The authors express their thanks to R. V. Telesnin for his valuable advice.

1/1

1/2 018 UNCLASSIFIED PROCESSING DATE--18SEP70

TITLE--BREAK IN THE MAGNETIC REVERSAL CURVE OF THIN MAGNETIC FILMS -U-

AUTHOR-(02)-KOLOTOV, O.S., POGOZHEV, V.A.

COUNTRY OF INFO--USSR

SOURCE--FIZ. METAL. METALLOVED, 1970, 29(1), 216-17

DATE PUBLISHED--------70

SUBJECT AREAS--MATERIALS, PHYSICS

TOPIC TAGS--METAL FILM, MAGNETIC THIN FILM, MAGNETIC DOMAIN STRUCTURE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1984/0186 STEP NO--UR/0126/70/029/001/0216/0217

CIRC ACCESSION NO--AP0054982

UNCLASSIFIED

2/2 018 UNCLASSIFIED PROCESSING DATE--18SEP70

CIRC ACCESSION NO--AP0054982

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE H SUBEFF PRIMEMAX.-H SUBR RELATION IS EXPLAINED BASICALLY BY VARIATION IN THE LEAKAGE FIELDS AND THE BREAK IN THE MAGNETIC REVERSAL CURVE BY SATN. OF THESE FIELDS. SATN. MAY BE DUE TO INCREASE IN MAGNETIC CHARGE ACCUMULATED ON THE DOMAIN WALLS, SPLITTING OFF WITH OPPOSITE DIRECTIONS OF ROTATION, RESULTING IN A VALUE AT WHICH THE MAGNETIC REVERSAL FIELDS START TO BE INHIBITED.

UNCLASSIFIED

1/2 028 UNCLASSIFIED PROCESSING DATE--18SEP70

TITLE--THRESHOLD FIELD OF HETEROGENEOUS ROTATION IN THIN PERMALLOY FILMS -U-

AUTHOR-(03)-KOLOTOV, O.S., POGOZHEV, V.A., TELESNIN, R.V.

COUNTRY OF INFO--USSR

SOURCE--FIZ. METAL. METALLOVED. 1970, 29(1), 217-19

DATE PUBLISHED-------70

SUBJECT AREAS--MATERIALS, PHYSICS

TOPIC TAGS--PERMALLOY, METAL FILM, ANISTROPY, DYNAMIC STRESS, MECHANICAL PROPERTY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1984/0185 STEP NO--UR/0126/70/029/001/0217/0219

CIRC ACCESSION NO--AP0054981

UNCLASSIFIED

2/2 028 UNCLASSIFIED PROCESSING DATE--18SEP70

CIRC ACCESSION NO--AP0054981

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. FOR SMALL DOMAIN STRUCTURE WIDTHS (L SMALLER THAN OR EQUAL TO MU), THE THRESHOLD FIELD MAY EXCEED THE EFFECTIVE ANISOTROPY FIELD BY A FACTOR OF 4-5 OR MORE. WITH INCREASING L, THE EXCESS OF THE THRESHOLD FIELD OVER THE ANISOTROPY FIELD DIMINISHES. WITH INCREASING DOMAIN STRUCTURE WIDTH, THE CONTRIBUTION OF MAGNETOSTATIC INTERACTION INCREASES, AND THIS AFFECTS NOT ONLY THE STATIC PROPERTIES OF THE FILM (E. G. INCREASING THE SQUARENESS OF THE HYSTERESIS LOOP IN THE DIFFICULT DIRECTION), BUT ALSO THE DYNAMIC PROPERTIES.

UNCLASSIFIED

Thin Films

USSR

UDC: 539.216.22:538.24

KOLOTOV, O. S., POGOZHEV, V. A., and TELESNIN, R. V., Moscow State University imeni M. V. Lomonosov

"The Threshold Field of Irregular Rotation on Thin Permalloy Films"

Sverdlovsk, Akademiya Nauk SSSR, Fizika Metallov i Metallovedeniye, Vol 29, No 1, Jan 70, pp 216-217

Abstract: The results are given of an investigation of the threshold field of irregular rotation in thin permalloy films (83 Ni;17 Fe). It may be expected that as the result of magnetization dispersion and magnetostatic interactions of local sections, the threshold field of irregular rotation at film magnetic reversal along the light axis must exceed the value of the effective anisotropy field $H_k$. The conditions of deposition were selected in such a way as to obtain finely divided films, i.e., films which divide themselves into a network of strip domains, more or less uniformly distributed on the film surface. The methods of Kobelev and Stein were used for measuring the anisotropy field. The threshold field $H_o$ was determined as a point of intersection of a straight line approximating the corresponding section of the magnetic reversal curve with the X-axis.

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USSR

KOLOTOV, O. S., et al, Akademiya Nauk SSR, Fizika Metallov i Metallovedeniye, Vol 29, No 1, Jan 70, pp 216-217

The magnetic reversal curve was accomplished precisely along the easy direction. The obtained dependence of the difference $\Delta H = H_o - H_{kK}$ on $\ell$ shows that for small $\ell$ ($\lesssim$10 micron) the magnitude of the threshold field may exceed $H_{kK}$ four or five times. Thus, with decreasing $\ell$ the role of the magnetostatic effect increases, and this appears not only on the film's static properties, but also on the dynamic properties. Orig. art. has: 1 figure, 1 table, and 14 references.

2/2

Physical Properties

USSR

UDC 669.017:538

KOLOTOV, O. S., and POGOZHEV, V. A. Moscow State University imeni M. V. Lomonosov

"Break in the Magnetic Switching Characteristic of Magnetic Films"

Sverdlovsk, Akademiya Nauk SSSR, Fizika Metallov i Metallovedeniye, Vol 29, No 1, Jan 70, pp 216-217

Abstract: The results are presented of an experimental investigation of the assumption that the variation of the switching coefficient is due to a slowdown in the growth of dispersion fields which arise from the appearance of film sections with an opposite direction of the rotation of local magnetization vectors. The internal effective $H_{eff}$ field, which slows down the process of inhomogeneous rotation, was investigated in order to learn the variation of dispersion fields corresponding to a transition from one section to switching characteristic to another. Particular attention was paid to the accuracy of matching the easy axis with the switching field direction, and also to a compensation of the magnetic field component normal to easy axis. The observed dependence of $H_{eff}^{max}$ on switching field $H_p$ is explained basically by the variation of the dispersion field, while the break in the switching curve is attributed to the saturation of those fields. Orig. art. has: 1 figure and 5 references.

1/1

USSR UDC 539.4

DOSHCHINSKIY, G. A., POGOZHEVA, N. V.

"Study of the Change in Elastic Constants of a Material Under Plastic Deformation"

Izv. Tomsk. politekhn. in-ta (News of Tomsk Polytechnical Institute), 1972, Vol. 225, pp 23-25 (from RZh-Mekhanika, No 8, Aug 72, Abstract No 8V900)

Translation: Youngs modulus $E$ and the Poisson coefficient $\mu$ as functions of plastic elongation $\delta$ were investigated on large cylindrical samples ($l$ = 700 mm, $d$ = 45 mm) of steel 20Kh are given. Weight distribution was achieved through equal stages of plastic deformation; the total deformation of the sample after 10-12 such stages reached 9-10%. It was observed that the value of $\mu$ first rose by 12-15% with the growth of $\delta$ and then almost did not change; the value of $E$, on the contrary, first drops off rapidly by 15-18% and then remains practically constant (after $\delta$ = 2-3%). The second elasticity coefficient $K$ and the shift modulus $G$ calculated in terms of $E$ and $\mu$ behave as follows: $K$ = const; the $G$ vs. $\delta$ graph is similar to the $E$ vs. $\delta$ graph.
R. A. Vasin.

1/1

USSR

UDC: 620.10

DOSHCHINSKIY, G. A., Candidate of Technical Sciences,
POGOZHEVA, N. V., Aspirant, POGOZHEV, A. M., Instructor,
Tomsk Polytechnic Institute

"Investigation of Anisotropy of Elastic Properties of Deformed Metal Under Linear Tension"

Moscow, Izvestiya Vysshikh Uchebnykh Zavedeniy,
Mashinostroyeniye, No. 4, 1971, pp 5-9

Abstract: Investigation was conducted on 6 mm thick steel plate in the original condition and after it was subject to 1, 2, 4 and 6% elongation in the longitudinal direction.

20 x 120 mm specimens were cut in directions between longitudinal and transvernal in 15° increments. Modulus of elasticity of these specimens were determined by means of a precision tension machine.

USSR

DOSHCHINSKIY, G.A., et al, Izvestiya Vysshikh Uchebnykh Zavedeniy, Mashinostroyeniye, No 4, 1971, pp 5-9

The difference between the maximum and minimum modulus is 3.6% in the original condition of the plate, 5% with the plate subject to 1% elongation, 8.5% with the plate subject to 2, 4 and 6% elongation.

The maximum modulus occurs at 50 to 60° from the longitudinal direction.

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USSR

POGRANICHNAYA, R. M., MERUBASHCHENKO, V. V., and CONCHAROVA, V. P.

"Determining the Active Magnesium in Granulated Magnesium"

Moscow, Zavodskaya laboratoriya, No. 5, 1971, pp 537-538

Abstract: Metallic magnesium in the granulate is used to desulphurize and modify cast iron. The purpose of the experiments described in this paper was to determine the granulated magnesium obtained from electrical metallic magnesium, a primary granulate practically free of impurities, as well as the granulated magnesium, a secondary granulate containing a large quantity of impurities, obtained from magnesium alloys and the wastes of magnesium production processes. The tests were made with a probe of granulated magnesium rid of chlorides and oxides of magnesium by processing with a 5% solution of chromic anhydride. Chlorine ions were introduced in the form of a solution of carnallite. Curves are given for the determinations of the active magnesium as a function of the chlorine ion concentration. A table is given comparing the results of the primary granulate analysis obtained by the

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USSR

POGRANICHNAYA, R. M., et al., Zavodskaya laboratoriya, No 5, 1971, pp 537-538

method given in this paper and by the gas-volumetric method. The authors are associated with the All-Union Titanium Scientific Research and Design Institute.

2/2

USSR

UDC 681.3.001:51

POGREBNOY, V. K.

"Covering Computer Circuits by Standardized Plug Units"

Izv. Tomsk. politekhn. in.-ta (News of Tomsk Politechnical Institute), 1970, No 211, pp 81-87 (from RZh-Avtomatika, Telemekhanika i vychislitel'naya tekhnika, No 2, Feb 71, Abstract No 2B25)

Translation: It is demonstrated that the problem of optimal covering of a computer circuit by standardized plug units can be formulated as a problem of integral linear programming. The bibliography has 2 entries.

1/1

USSR UDC: 681.2.008:519.21

POGREBETSKIY, P. I., SAAKYAN, E. A.

"Determination of an Estimate of the Mathematical Expectation of Unstable Processes"

Moscow, Metrologiya, No 12, 1972, pp 37-44.

Abstract: A method is studied for estimating the mathematical expectation of unstable processes, based on preliminary approximation of the initial random process by a Lagrange interpolation polymonial. An estimate is produced, expressed through the coefficients of the approximating polymonial. Examples are presented. The results produced can be used in the development of apparatus for measurement of the characteristics of random processes.

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USSR UDC 553.98:551.247:550.837.622.241(574.12/13)

ANISHCHENKO, G. N., DEMENT'YEVA, I. G., VILENCHIK, A. M., MITROFANOV, K. P., POGREBINSKIY, S. A., ROMANENKO, V. P., and FOMENKO, K. Ye., Trust for Special Geophysical Operations, Ministry of Geology, USSR

"Electrometric Research on the Border Zone of the Pre-Caspian Depression by the Method of Telluric Currents"

Moscow, Neftegazovaya Geologiya i Geofizika, No 5, 1972, pp 36-42

Abstract: The article summarizes the results of research in the pre-Caspian depression by the method of telluric currents. This method was used for mapping the elements of the salt tectonics in this territory on the basis of the acute difference between the specific resistence of the salt and that of the sediments of the persalt complex. The results, classified according to the regions of the investigated territory and the character of the relation with the cross-section, are briefly set forth. An analysis of the nature of the telluric anomalies is given. 4 figures.

1/1

USSR UDC: 8.74

POGREBINSKIY, S. B., FISHMAN, Yu. S.

"Dialogue System for Analytic Solution of Certain Problems of Linear Algebra"

Teoriya Yazykov i Metody Postroyeniya Sistem Programmir. [Theory of Languages and Methods of Construction of Programming Systems--Collection of Works], Kiev-Alushta, 1972, pp 329-337 (Translated from Referativnyy Zhurnal Kibernetika, No 11, 1972, Abstract No 11V561)

Translation: A dialogue system for analytic solution of certain problems in linear algebra is described. The process of problem solving in the dialogue mode is defined by a sequence of directives which the human operator inputs by typewriter. The directives contain the minimum of information necessary for operation of the corresponding program and by switching control to the program. There are seven such programs in all. The characteristics of these programs are presented. The first program forms a file of coefficients. The second program performs linear combination. The third program performs redefinition. The fourth and fifth programs exclude the unknown and change the nature of the sequence of operation. The sixth program switches columns during expansion of determinants or the order of unknown systems of linear equations. The seventh

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USSR

Pogrebinskiy, S. B., Fishman, Yu. S., Teoriya Yazykov i Metody Postroyeniya Sistem Programmir., Kiev-Alushta, 1972, pp 329-337

program shifts rows. An example of solution of an actual fifth order system is presented.

2/2

Acc. Nr: AP0047186 Ref. Code: UR 0216

PRIMARY SOURCE: Izvestiya Akademii Nauk SSSR, Seriya Biologicheskaya, 1970, Nr 1, pp 100-103

A. V. POZREBKOVA

# ON THE PARTICIPATION OF THE ANTERIUR LOBE OF THE LIMBIC REGION IN THE REGULATION OF RESPIRATION

*I. P. Pavlov Institute of Physiology*

The study of the structure and function of the respiration analyser has led to the necessity of the investigation of the role of the anterior region of the limbic brain cortex in the analysis of afferent impulses formed in the receptors of the respiratory system and as it is known, playing an important role in the regulation of known (chronic experiments on dogs with the formation of a system of various reflexes) bilateral removal of these cortex regions leads to prolonged disturbances of the analysis of stimuli directed to the receptors of the respiratory apparatus. On the other hand the reflexes formed as a result of excitations of other receptor regions did not undergo any tangible changes.

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Control removal of other regions of the brain cortex (occipital) also did not interfere with the activity of the respiratory system.

Both our previous investigations as well as the data of the present one suggest the possibility of a transfer of the anterior region of the limbic cortex as well as the region of the cortex of gyrus sigmoideus to the realm of the structure of the respiratory analyser.

2/2 19790682

USSR

POGREBNOY, V. K.

"Solution of One Problem in Discrete Programming with Boolean Variables"

Kibernetika i vuz. [Cybernetics and the University -- Collection of Works], No 4, Tomsk University Press, 1971, pp 127-132, (Translated from Referativnyy Zhurnal, Kibernetika, No 3, 1972, Abstract No 3 V436 by Yu. Finkel'shteyn).

Translation: The study of problems of unification during synthesis of complex structures leads to problems of the following type:

$$z=\sum_{j=1}^{n} c_j x_j \to \max, \tag{1}$$

$$\sum_{j=1}^{n} a_{ij} x_j \leqslant b_i, \quad i=1, 2, \ldots, m, \tag{2}$$

$$x_j=0 \text{ или } 1, \quad j=1, 2, \ldots, n. \tag{3}$$

Here

$$a_{ij}, b_i \geqslant 0, c_j=1. \tag{4}$$

An algorithm in branches and bound is suggested for the solution of problems (1)-(3), in which in selecting the prospective direction of branching, the

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USSR

POGREBNOY, V. K., Kibernetika i vuz., No 4, Tomsk University Press, 1971, pp 127-132.

specific features of the problem are used (condition (4)). A numerical example is studied. There are a few misprints and incautious statements.

USSR

POGREBNYAK, A., head of the Information Department of the Main Pharmaceutical Administration

"A New Anti-Viral Preparation"

Moscow, Rabochaya Gazeta, 25 Nov 72, p 4

Translation: Oksolin is an original preparation synthesized at the All-Union Scientific Research Chemical Pharmaceutical Institute imeni S. Ordzhonikidze. It has a pronounced effect on various viruses, including the influenza virus.

Oksolin ointment is used to treat various skin diseases: herpes simplex, dermatitis herpetiformis (Duhring's disease), psoriasis, molluscum contagiosum. The ointment is to be applied to the infected areas of the skin 2-3 times a day until fully healed.

For viral rhinitis, a 0.25% solution of the ointment is to be applied for a period of 3-4 days.

For the purpose of prophylaxis during the period of maximum outbreak of influenza, it is recommended that it be applied 1-2 times daily to the mucous membranes. This should be done for 25 days.

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USSR

UDC: 620.171.2

SKLYARGV, N. M., KONONCHUK, N. I., ISHCHENKO, I. I., POGREBNYAK, A. D., LOZITSKIY, L. P., SHIPIL', V. Ya., LAPITSKIY, Yu. A., SINAYSKIY, B. N., KUPAYEV, V. N., Kiev

"Determination of Durability of Heat-Resistant Alloys in Unstable Operating Modes Considering Brief Overloads"

Kiev, Problemy Prochnosti, No 3, Mar 73, pp 100-104.

Abstract: The specific features of application of the linear hypothesis of addition of damage during calculation and accelerated experimental determination of the guaranteed durability of parts operating with brief overloads during individual stages in the program of unstable loading with static and variable loads are studied, as well as problems of adjustment of the corresponding calculation characteristics for heat-resistant alloys. The concept developed by the authors is in that the share of durability expended at any moment is determined by successive addition of its parts for stages of the program under the combined influence of loads and temperatures in a quasi-stable mode for each stage; the sets of long-term static strength and endurance characteristics are utilized, considering the influence of the loading prehistory and the corresponding limiting curves for various

USSR

SKLYAROV, N. M., et al, Kiev, Problemy Prochnosti, No 3, Mar 73, pp 100-104

temperatures and durabilities. The spectrum of loads is studied in combination with the sequence of their application, i.e., in time.

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USSR UDC 620.178.38:620.197

ISHCHENKO, I. I., OMEL'CHENKO, V. I., SINAYSKIY, B. N., POGREBNYAK, A. D., BANAS, P. S., REZNIK, M. I., Kiev, Zaporozh'ye

"Study of Influence of Heat Resistant Coatings on Fatigue Strength of Refractory Alloy"

Problemy Prochnosti, No 10, 1971, pp 76-81.

Abstract: This work presents results of studies of the influence of certain types of heat resistant coatings on the fatigue strength of ZhS6K nickel alloy, widely used for aviation engine turbine blades. None of the coatings studied were found to increase fatigue resistance without preliminary heating of the specimens. Preliminary heating without application of the coatings caused a decrease in fatigue resistance. However, the combination of preliminary heating to 950°C for 1,000 hours with application of coatings (nitriding and application of aluminozirconium coatings) caused an increase in fatigue resistance.

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USSR

UDC 620.178.38:620.193

SINAYSKIY, B. N., POGREBNYAK, A. D., ISCHENKO, I. I., Institute of Strength Problems, Academy of Sciences, Ukrainian SSR

"The Effect of Test Temperature Upon the Fatigue Strength of Alloy ZhS6K"

Kiev, Problemy Prochnosti, No 2, Feb 72, pp 24-31

Abstract: The fatigue strength of the nickel-base turbine-blade alloy ZhS6K was investigated within the working-temperature range 600 — 1000°C. Acute weakening of the material was observed to occur at temperatures in the top portion of the working range. The fatigue properties of this alloy changed differently for symmetric and asymmetric loading cycles in the vicinity of the upper and lower boundaries of the investigated temperature range. It was established that after preliminary holding at 950° C for 1000 hour's the fatigue strength of the material decreases, the tensile strength and the maximum hardness decrease, and the chemical composition of the surface layers changes. Seven figures, 9 references.

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POGREBNYAK, A. D.

JPRS 55972

12 May 1972

UDC 620.178.38:620.197

# INVESTIGATION OF THE INFLUENCE OF OXIDATION-RESISTANT COATINGS ON THE FATIGUE STRENGTH OF HEAT-RESISTANT ALLOY

[Article by I. I. Ishchenko, V. F. Omel'chenko, B. N. Sinayskiy, A. D. Pogrebnyak, P. S. Banas, M. I. Reznik (Kiev, Zaporozh'ye); Kiev, Problemy Prochnosti, Russian, No 10, 1971, signed to press 8 February 1971, pp 76-81]

The use of heat-resistant alloys with good strength properties increases the service life of gas turbine engines.

Service life can be increased even further by certain design and technological measures, one of which is the use of oxidation-resistant coatings for protecting parts from oxidation. This is particularly important in connection with high working temperatures in an engine. The most reliable results can be obtained from tests of an engine with coated parts. Such tests, however, are extremely expensive and take a long time. Therefore they must be preceded by investigations of specimens and structural components under laboratory conditions.

A great deal of work has been done on investigation of the structure of coatings, their oxidation resistance in the unstressed state, development of the technology of application of coatings. However, evaluation of the effectiveness of oxidation-resistant coatings according to data on their structure, composition and oxidation resistance is not sufficiently reliable without additional determination of the strength properties of materials and structural components with coatings under conditions approximating operating conditions, i.e., under the influence of working stresses and temperatures, real media and other factors [1-3]. Moreover, the use of many heat-resistant materials depends largely on the choice of coating. Consequently the effectiveness of an oxidation-resistant coating is determined largely on the basis of results of investigation of the strength characteristics of heat-resistant materials with coatings. In such investigations great attention should be devoted to evaluation of the effectiveness of the coatings under conditions of variable stresses, when the state of the surface layer plays a particularly important role.

It has been demonstrated [4-7] that the influence of oxidation-resistant coatings on the fatigue strength of heat-resistant materials is

USSR UDC 619:616.981.51-036.21

BONDARENKO, G. F., POGREBNYAK, L. I., DUBROVIN, Ye. I., KHARCHUK, A. N., and SHEPCHENKO, V. U., Ukrainian Scientific Research Institute of Experimental Veterinary Science

"Some Problems of the Epizootiology of Anthrax"

Moscow, Veterinariya, No 6, Jun 73, pp 48-50

Abstract: In the period 1949-1970, the number of outbreaks of anthrax of farm animals, the incidence of anthrax among these animals, and the mortality rate of animals from anthrax decreased in the UkrSSR by factors of 11.1, 12.8, and 11.5, respectively. The incidence of anthrax of cattle increased from 57.2 to 73.8%, with the cattle owned by the population being affected to the principal extent, while that of sheep and goals decreased. Anthrax of hogs increased. The number of outbreaks of the disease and of the animals affected by it during the period under consideration were highest in the forest-steppe zone of the UkrSSR, being followed by the Steppe, Carpathian mountains and foothills, and forest zone, in that order. Of all identified stationary points unsatisfactory from the sanitary standpoint with respect to anthrax, 77.7% have been inactive for more than 11 yrs. 1/2

USSR

BONDARENKO, G. F., et al., Veterinariya, No 6, Jun 73, pp 48-50

The number of such points that were newly recorded decreased vs. 1946 by a factor of 25.7 on the average in 1966-1970 and by a factor of 40 in 1970. One of the conditions that contributes to the persistence of outbreaks is the presence of Bac. anthracis in the soil at locations of old cattle burying grounds. Research is being conducted on the isolation from infected soil of actinomycetes with a heightened antibacterial activity towards Bac. anthracis with the view of applying these actinomycetes for the decontamination of cattle burying grounds.

USSR

UDC 621.43.052.001.5

SOBOL', V. N., ZEL'DES, N. L., Candidates of Technical Sciences, POGREBNYAK, V. V., and SKAZHENIK, A. M., Engineers

"Strong Supercharging of the 10D100 Engine by Gas Turbine Compressor"

Leningrad, Energomashinostroyeniye, No 7, July 72, pp 17-18

Abstract: An analysis is presented of modifications and improvements to a gas turbine compressor TK-34, intended to increase its efficiency in a forced regime up to the value of pressure rise ratio $\pi = 2.1$. The theoretical results were substantiated by tests conducted on modified serial TK-34 turbocompressors. They show that a reduction is obtained in specific effective fuel consumption.

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USSR UDC 629.7.036.3.002.4

PEN'KOV, A. M., POGREVNAYAK, A. D., KUFAYEV, V. N., SINAYSKIY, V. N.

"Use of Complex Method of Estimating Reliability to Study Heat-Resistant Materials for Gas Turbine Engine Parts"

Sb. Nauch. Tr. Kiev. In-t Insh. Grazhd. Avnatsii, [Collected Scientific Works of Kiev Civil Aviation Engineering Institute], 1971, No 4, pp 69-73. (Translated from Referativnyy Zhurnal Aviatsionnye i Raketnyye Dvigateli, No 1, 1972, Abstract No 1.34.77 from the resume).

Translation: Fatigue tests were performed in order to estimate the durability of alloy EI617 under variable temperature conditions. The tests reproduced a temperature program imitating the temperature changes of blades in operation. The test results are presented as a fatigue curve. The points on the curve express the mean durabilities from the results of testing of 8 to 10 specimens at each level. To evaluate the behavior of the material under near actual conditions, the variable components of the power and temperature programs were reproduced. As before, the stresses in the program were decreased in stages from 39 to 31.5 kg/mm$^2$, then increased to 39.5 kg/mm$^2$. The damage to the alloy

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USSR

PEN'KOV, A. M., et al., Sb. Nauch. Tr. Kiev. In-t Insh. Grazhd. Avnatsii, 1971, No 4, pp 69-73

was evaluated on the basis of the values of the durability criterion with combined loading $a_k$. Testing of a series of specimens indicated the value of $a_k$=0.70, indicating intensive damage to EI617 alloy under the combined influence of variable temperatures and stresses. The application of the static component $\sigma_{st}$=20kg/mm$^2$ caused a slight increase in the durability criterion with combined reproduction of stresses and temperatures up to $a_k$=0.99. 5 figs.

2/2

USSR

UDC 615.919"598.127.011.5.074:543.544

POGUDA, A. A., CHERTKOVA, F. A., and GOLSHMID, V. K., State Control Institute of Medical and Biological Preparations imeni Tarasevich, and Moscow Scientific Research Institute of Vaccines and Sera

"Composition of Viper Venom as Determined by Column Chromatography"

Moscow, Byulleten' Eksperimental'noy Biologii i Meditsiny, No 7, 1971, pp 45-47

Abstract: Fractionation of Vipera lebetina venom on Sephadex G-100 revealed two protein peaks. The lethal factor and coagulase were associated with the first peak, hemolysin with the second, and hyaluronidase with both. However, fractionation of the venom on Sephadex G-200 resulted in the separation of all four factors. Besides the main molecular forms, it revealed additional fractions of lethal, hyaluronidase, and hemolytic activity. When ion-exchange chromatography on DEAE-cellulose was used, the lethal factor, coagulase, and hyaluronidase could not be separated. Hemolysin was obtained, but when injected intravenously into mice it failed to kill any of the animals or produce noticeable pathological changes.

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1/2 019 UNCLASSIFIED PROCESSING DATE--27NOV70

TITLE--COMBATTING BRUCELLOSIS -U-

AUTHOR-(02)-POGULYAY, V.D., ORLOVA, G.V.

COUNTRY OF INFO--USSR

SOURCE--VETERINARIYA, 1970, NR 1, PP 52-54

DATE PUBLISHED--------70

SUBJECT AREAS--AGRICULTURE, BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--BRUCELLOSIS, DISEASE CONTROL, EPIZOOTIOLOGY, VACCINATION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3007/1290 STEP NO--UR/0346/70/000/001/0052/0054

CIRC ACCESSION NO--AP0136696

UNCLASSIFIED

2/2 019 UNCLASSIFIED PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AP0136696

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. BRUCELLOSIS IN ALTAY KRAY HAS DECREASED FROM FORMER PEAKS TO 3.8 AND 3.5PERCENT POSITIVELY REACTING CATTLE AND SHEEP, RESPECTIVELY, IN 1955. THE BRUCELLOSIS CONTROL PROGRAM EMPHASIZED ISOLATED REARING OF YOUNG, DISTRIBUTION OF PASTURES BY EPIZOOTIOLOGICAL CRITERIA, ORGANIZATION OF SUMMER QUARTERS, GRADUAL ELIMINATION OF BRUCELLOSIS ISOLATION AREAS, AND DISINFECTION MEASURES. SPECIAL ATTENTION WAS PAID TO SEMINARS WITH VETERINARY AND MEDICAL SPECIALISTS ON BRUCELLOSIS DIAGNOSIS AND SANITATION (VACCINATION AND EXTERMINATION PROCEDURES, ETC.). ON FARMS WITH SMALL HERDS, SEROLOGICAL TESTING AND SLAUGHTER WERE EMPLOYED. ANIMALS IN UNSAFE AREAS WERE VACCINATED WITH STRAIN 19 VACCINE. A TOTAL OF 2.5 MILLION HEAD OF CATTLE WERE VACCINATED BETWEEN 1955 AND 1967. VACCINATION PROGRAMS HELPED ELIMINATE BRUCELLOSIS IN UNSAFE AREAS WITHIN THREE YEARS. ANIMALS WERE REEXAMINED 1.5-2 YEARS AFTER VACCINATION OR 2.5-3 YEARS AFTER REVACCINATION; HIGH POSITIVES WERE SLAUGHTERED AND LOW POSITIVES KEPT UNDER OBSERVATION. NEW MEASURES PLANNED FOR 1971 WERE MOSTLY DESIGNED TO PREVENT THE SPREAD OF THE DISEASE INTO THE AREA FROM THE OUTSIDE. FACILITY: ALTAYSKOYE KRAYSEL'KHOZUPRAVLENIYE.

UNCLASSIFIED

1/2 030 UNCLASSIFIED PROCESSING DATE--30OCT70

TITLE--LARGE OBJECTS FROM AERATED POROUS SLAG CONCRETE -U-

AUTHOR-(03)-ROZENFELD, L.M., BORISOVA, A., POGULYAYEV, S.

COUNTRY OF INFO--USSR

SOURCE--BUDIVEL'NI MATER. KONSTR. 1970, (1), 9-11

DATE PUBLISHED--------70

SUBJECT AREAS--MATERIALS, MECH., IND., CIVIL AND MARINE ENGR

TOPIC TAGS--SLAG, CONCRETE, ELECTRIC POWER PLANT, INDUSTRIAL WASTE, ELASTIC MODULUS, FROST

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--2000/0796 STEP NO--UR/0635/70/000/001/0009/0011

CIRC ACCESSION NO--AP0124465

UNCLASSIFIED

2/2 030 UNCLASSIFIED PROCESSING DATE--30OCT70
CIRC ACCESSION NO--AP0124465
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. FLY ASH FROM THE LUGANSK ELEC. POWER STATION WAS SUCCESSFULLY USED TO MANUF. POROUS SLAG CONCRETE. UNDER OPTIMUM TECHNOL. CONDITIONS, CONCRETE WITH A BULK D. OF 1000 KG-M PRIME3 HAD THE FOLLOWING PHYS. MECH. PROPERTIES: CRUSHING STRENGTH 75 KG-CM PRIME2, DYNAMIC MODULUS OF ELASTICITY 35,600 KG-CM PRIME2, COEFF. OF FROST RESISTANCE AFTER 50 FREEZING THAWING CYCLES, EQUALS 1.

UNCLASSIFIED

USSR UDC 619:616.9-022.6+636.1+636.2+636.4+636.52/.58

POGULYAYEVA, L. V.; TSYRO, V. A.

"Serological Examination of Swine With Ornithosis Antigen on Farms in Omsk Oblast"

V sb. Sb. nauchn. rabot. Sib. n.-i. vet. in-t. (Siberian Scientific Research Veterinary Institute -- Collection of Scientific Works), No 17, 1970, pp 223-226 (from RZh-58. Zhivotnovodstvo i Veterinariya, No 4, Apr 71, Abstract No 4.58.569)

Translation: In 1965 and 1967, serological examination with ornithosis antigen of 353 swine from various Omskaya Oblast farms showed the presence of inhibitor antibodies for viruses of the OLT /ornithosis-lymphogranuloma-trachoma/ group in titers of 1:4 to 1:16 in 71 swine (20.1%). Positive reactions were obtained for 18.6% of swine 2-4 months old, for 47.9% of swine 3.5 months old, for 59.5% of the 6-8 month age group, and for 7.7% of adult swine. In 23 healthy young pigs aged 2.4 months, a negative complement fixation inhibition reaction was obtained. The infectivity of swine with OLT-group viruses was established by these studies, the first ones in Western Siberia.

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USSR UDC 621.317.311

PAVLOV, S. S., POGULYAYEVSKIY, YA. S., FROLOV, V. P.

"Autooscillator Direct-Current Amplifier for Measuring Small Direct Currents"

Avtomatiz. khim. proiz-v--V sb. (Automation of Chemical Production -- collection of works), vyp. 5, Moscow, 1970, pp 103-109 (from RZh-Radiotekhnika, No 4, Apr 71, Abstract No 4A273)

Translation: A study is made of some results of creating small current meters on the basis of varicaps which are used for conversion of DC signals to AC signals. A decrease in the zero drift effect on the measurement results is achieved. It is demonstrated that when using varicaps with a p-n-junction the meters have a sensitivity of up to $1 \cdot 10^{-12}$ amps, and when using surface varicaps, up to $1 \cdot 10^{-14}$ amps.

1/1

POKAL'CHUK, A.

DOSAAF

USSR/Mil/RU

BABYNIN, Ye., Lt Col, author of article about the DOSAAF organization of the Ukraine and the awards it has won. He identified:

POKAL'CHUK, A., Lt Gen, Chairman of the Central Committee of the Ukrainian SSR, speaker at press conference.

Krasnaya Zvezda, 20 Jan 73, p 2, col 1

(2)

Acc. Nr: AP0050041 Abstracting Service: CHEMICAL ABST. 5/70 Ref. Code: UR 0109

105051g Pressure sensitivity of Schottky diode current. Elinson, M. I.; Pokalyakin, V. I.; Polyakova, A. L.; Stepanov, G. V.; Shklovskaya-Kordi, V. V. (Inst. Radiotekh. Elektron., Moscow, USSR). *Radiotekh. Elektron.* 1970, 15(1), 210–12 (Russ). The effect of a const. or alternating pressure from corindon or glass needles on Shottky diodes obtained by sputtering of a Au film on *n*-Si was studied. The mechanism of current change is discussed, and the role of modifications of surface center states is pointed out. G. Thirot

1/1

REEL/FRAME
19801980

4 Nt

USSR

UDC 621.398.93

SHCHERBAN', A. N., FURMAN, N. I., PRIMAK, A. V., KOPEIKIN, V. I., POKARZHEVSKIY, A. S., MARUSOV, A. G., DASHEVSKIY, L. N., and KHOMYAKOV, A. T., Institute of Technical Heat Physics, Acad. Sc. Ukr SSR, Gas Institute, Acad. Sc. UkrSSR

"Telemetric System for Sanitation-Chemical Control of Air Pollution"

Kiev, Khimicheskaya Tekhnologiya, No 3, (63), May-Jun 72, pp 49-52

Abstract: A complex system is discussed designed to fulfill the following functions: organization of the input operations of the informations from control-determination points (CDP) into the computer memory with wide range of possible changes in the frequency and order of query to CDP; determination of the measurement points with higher pollution and increased frequency of queering the respective recorder; statistical treatment of the information, tabulation or graphing of the results; and analysis of the effectiveness of the utilization of purifying equipment by the change in air pollution in a controlled region.

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UDC 535.3:551.51

USSR

KALLISTRATOVA, M.A., POKASOV, V.V. [Institute Of Atmospheric Physics, AS,USSR]

"Correlation Measurement Of 'Wandering' Of Light Centers Of Gravity Of Spatially Limited Beams In A Turbulent Atmosphere"

Izv.VUZ:Radiofizika, Vol XV, No 5, May 72, pp 725-731

Abstract: The results are presented of measurements of the correlation functions of the "wandering" light centers of gravity of two light beams propagated at 250 and 650 meter long courses near the earth. The measurements were made for the cases where either the points of entrance or the points of observation are spaced. Apparatus and methods of measurement and the principles of measurement are discussed. Light beams from helium-neon lasers ($\lambda$ = 0.63 micrometer) passing the turbulent layer were scanned at the receiving point with the aid of a rotating mirror by a narrow vertical slit behind which a photomultiplier was mounted. For an investigation of the correlation functions of "wandering," two beams from two lasers were used with mutually perpendicular polarization planes. The scheme of the transmission unit and a bloc diagram of the receiving apparatus are described. The results of the measurements are compared with theoretical calculations. The authors thank A.S. Gurvich for valuable consultations and discussions. 7 fig. 15 ref. Received by editors, 14 June 1971.

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USSR UDC 621.791.76:621.7.044.2.052:621.791.011

POKATAYEV, YE. P., Engineer, TRYKOV, YU. P., Candidate of Technical Sciences, KHRAPOV, A. A., Engineer, Volgograd Polytechnic Institute

"Residual Stresses in Explosion-Welded Joints"

Moscow, Svarochnoye proizvodstvo, No 9, 1972, pp 10-12

Abstract: A study was made of the distribution law of the residual stresses with respect to thickness of explosion-welded joints between like (steel-steel) and unlike (steel-titanium) metals. The residual stresses were determined in rods cut from bimetal billets 250 × 250 mm. The thickness of the base layer of MSt.3 steel was 31.5 mm in the steel-steel joint and 37 mm in the steel-titanium joint. The thickness of the cladding layer of MSt.3 steel and OT4-1 alloy was the same, 10 mm, in both cases. Graphs were plotted for the hardness distribution in an explosion-welded joint of steel-steel, steel-titanium, the OT4-1 titanium alloy in the initial state and MSt-3 steel in the initial state, the variation of the relative deformation of bimetal steel-titanium rods on removal of layers from the titanium and steel sides, the distribution of the residual stresses in the steel-steel bimetal obtained by explosion welding for longitudinal and transverse specimens after welding and after annealing, the residual stress distribution in the steel-titanium bimetal after explosion welding and the residual stress distribution in the steel-titanium bimetal

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USSR

POKATAYEV, YE. P., et al., Svarochnoye proizvodstvo, No 9, 1972, pp 10-12

after tempering. After annealing the residual stresses in the steel-steel bimetal were eliminated in practice as a result of intense relaxation of high temperatures and subsequent uniform cooling. In the steel-titanium bimetal, after tempering a new residual stress field arose caused by the different thermal expansion of the layers.

The residual stresses in the explosion-welded bimetals can be determined by the same methods as in uniform materials. The nature of the residual stress distribution in the initial state after welding is in practice the same in the joints between like and unlike materials.

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1/2 018 UNCLASSIFIED PROCESSING DATE--11DEC70

TITLE--ELECTRON PHONON INTERACTION EFFECTS IN FERROELECTRIC CRYSTALS -U-

AUTHOR--PERATILOV, YE.P.

COUNTRY OF INFO--USSR

SOURCE--UKR. FIZ. ZH. (RUSS. ED.) 1970, 15(3), 519-21

DATE PUBLISHED--------70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--FERROELECTRIC CRYSTAL, ELECTRON PHONON INTERACTION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3007/0074 STEP NO--UR/0185/70/015/003/0519/0521

CIRC ACCESSION NO--AP0135771

UNCLASSIFIED

2/2 018 UNCLASSIFIED PROCESSING DATE--11DEC70
CIRC ACCESSION NO--AP0135771
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE EFFECTS WERE STUDIED OF ELECTRON PHONON INTERACTIONS WITH THE PARTICIPATION OF FERROACTIVE VIBRATIONS (SMOLENSKII AND KRAINIK, 1969). THE CONDITIONS ARE CONSIDERED UNDER WHICH RESONANCE AND NONRESONANCE PHENOMENA WOULD BE OBSD. FACILITY: KISHINEV, GOSUNIV., KISHINEV, USSR.

UNCLASSIFIED

1/2 029 UNCLASSIFIED PROCESSING DATE--20NOV70

TITLE--THERMODYNAMIC FUNCTIONS OF PIEZOELECTRIC POLARONS IN STEADY MAGNETIC FIELD AND CYCLOTRON RESONANCE -U-

AUTHOR-(02)-KLYUKANOV, A.A., POKATILOV, E.P.

COUNTRY OF INFO--USSR

SOURCE--PHYSICA STATUS SOLIDI, 1970, VOL 39, NR 1, PP 227-286

DATE PUBLISHED--------70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--PIEZOELECTRIC MATERIAL, POLARON, THERMODYNAMIC FUNCTION, WEAK MAGNETIC FIELD, STRONG MAGNETIC FIELD, ELECTROMAGNETIC ENERGY, MAGNETIC SUSCEPTIBILITY, SPECIFIC HEAT, CYCLOTRON RESONANCE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1992/1440 STEP NO--GE/0030/70/039/001/0277/0286

CIRC ACCESSION NO--AP0112434

UNCLASSIFIED

2/2 029 UNCLASSIFIED PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0112434

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE SUM OVER PIEZOELECTRIC POLARON STATES IS CALCULATED AT WEAK AND STRONG MAGNETIC FIELDS. FEYNMAN'S PATH INTEGRAL VARIATIONAL METHOD IS USED TO CALCULATE THE THERMODYNAMIC FUNCTIONS, I.E. ENERGY, MAGNETIC SUSCEPTIBILITY, AND SPECIFIC HEAT. CYCLOTRON RESONANCE OF PIEZOELECTRIC POLARONS IS CONSIDERED AND A COMPARISON OF THEORETICAL AND EXPERIMENTAL RESULTS IS GIVEN.

FACILITY: DEPARTMENT OF THEORETICAL PHYSICS, KISHINEV STATE UNIVERSITY, KISHINEV.

UNCLASSIFIED

1/2 017 UNCLASSIFIED PROCESSING DATE--30OCT70

TITLE--MAGNETIC FIELD RECOMBINATION OF ELECTRONS AND DONORS -U-

AUTHOR-(02)-POKATILOV, YE.P., RUSANOV, M.M.

COUNTRY OF INFO--USSR

SOURCE--FIZ. TVERD. TELA 1970, 12(4), 1254-6

DATE PUBLISHED-------70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--MAGNETIC FIELD, ELECTRON RECOMBINATION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1998/0920 STEP NO--UR/0181/70/012/004/1254/1256

CIRC ACCESSION NO--AP0121522

UNCLASSIFIED

2/2 017 UNCLASSIFIED PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0121522

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE PROBLEM WAS CONSIDERED OF THE EFFECT OF A MAGNETIC FIELD ON THE MAGNITUDE OF THE TRANSVERSE CAPTURE OF ELECTRONS BY DONORS. IMPURITY ELECTRONS WERE CONSIDERED TO BE REMOVED FROM THE LOCALIZED STATES BY AN EXTERNAL FIELD (E.G., LIGHT) AND TO COME TO THERMAL EQUIL. WITH THE LATTICE AND RECOMBINE. WAVE FUNCTIONS WERE OBTAINED FOR THE DISCRETE SPECTRUM IN TERMS OF THE ORTHOGONAL FUNCTIONS OBTAINED BY THE VARIATION METHOD. THE RECOMBINATION CROSS SECTION INCREASES WITH INCREASING FIELD. FACILITY: KISHINEV. GOS. UNIV., KISHINEV, USSR.

UNCLASSIFIED

1/2 036 UNCLASSIFIED PROCESSING DATE--27NOV70

TITLE--NUCLEAR GAMMA ACOUSTIC RESONANCE, IN METAL CRYSTALS -U-

AUTHOR--POKAZANYEV, V.G.

COUNTRY OF INFO--USSR

SOURCE--FIZIKA METALLOV I METALLOVEDENIE, MAR. 1970, 29, (3), 496-501

DATE PUBLISHED-------70

SUBJECT AREAS--PHYSICS, MATERIALS

TOPIC TAGS--NUCLEAR RESONANCE, ACOUSTIC RESONANCE, METAL CRYSTAL, RESONANCE ABSORPTION, GAMMA RAY ABSORPTION, ULTRASONIC WAVE, ULTRASONIC FREQUENCY, IRON ISOTOPE, PHOTON EMISSION, LARMOR FREQUENCY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3002/1818 STEP NO--UR/0126/70/029/003/0496/0501

CIRC ACCESSION NO--AP0129186

UNCLASSIFIED

2/2 036 UNCLASSIFIED

CIRC ACCESSION NO--AP0129186 PROCESSING DATE--27NOV70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE EFFECT OF NUCLEAR ACOUSTIC RESONANCE IN METAL CRYSTALS ON THEIR RESONANCE ABSORPTION AND EMISSION OF GAMMA QUANTA IS CONSIDERED THEORETICALLY. THE INTENSITY OF GAMMA ABSORPTION IN THE PRESENCE OF AN ULTRASONIC WAVE VARIES WITH THE FREQUENCY OF THE LATTER IN A MANNER BEST REPRESENTED IN THE FORM OF A CONVENTIONAL RESONANCE CURVE. THIS RELATIONSHIP IS ILLUSTRATED FOR THE CASE OF PRIME57 FE NUCLEI. IF THE FREQUENCY OF THE ULTRASOUND EQUALS THE LARMOR FREQUENCY OF THE NUCLEI IN THE EXCITED STATE, THEN ACOUSTIC RESONANCE OF THE NUCLEI IN THIS STATE REVEALS ITSELF BY WAY OF THE APPEARANCE OF ADDITIONAL LINES OF GAMMA RADIATION.

UNCLASSIFIED

APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002202510001-8"

USSR

POKHIL, P. F., BELYAYEV, A. F., et. al.,

"Combustion of Powdered Metals in Active Media"

Goreniye Poroshkoobraznykh Metallov v Aktivnykh Sredakh., Nauka Press, Moscow, 1972, 293 pages.

Translation of Annotation: This book is dedicated to important and pressing problems of the ignition and combustion of such metals as aluminum, beryllium, magnesium, boron, lithium and others, broadly used in new technology. They allow, for example, significant improvement of the physical and chemical characteristics of rocket fuels. The book presents and summarizes extensive experimental and theoretical material, produced by Soviet and foreign authors over the past 10 to 15 years. Modern methods of investigation and the primary regularities of ignition and combustion of metals are also presented, the problem of the influence of metal additives on the physical-energetic parameters of powders and explosives are also presented.

The book is designed for scientific workers and engineers working in the area of combustion, as well as teachers at universities, graduate students and undergraduates specializing in this area. 51 Tables; 148 Figures; 356 Biblio. Refs.

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USSR

POKHIL, P. F., BELYAYEV, A. F., et. al., Goreniye Poroshkoobraznykh Metallov v Aktivnykh Sredakh., Nauka Press, Moscow, 1972, 293 pages.

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USSR

POKHIL, P. F., BELYAYEV, A. F., et. al., Goreniye Poroshkoobraznykh Metallov v Aktivnykh Sredakh., Nauka Press, Moscow, 1972, 293 pages.



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USSR

UDC 629.7.036.54-66:536.46

SUKHANOV, L. A., GOSTINTSEV, YU. A., and POKHIL, P. F.

"The Interaction of Burning Gunpowder with the Acoustic Field in the Presence of Equilibrium Reversible Chemical Reactions in a Gas Behind the Flame Front"

Odessa, 11-ya Vses. Konf. po Vopr. Isparenlya, Goreniya i Gaz. Dinamiki Dispersn. Sistem, 1972 -- Sbornik (11-th All-Union Conference on Problems of the Evaporation, Combustion, and Gas Dynamics of Dispersed Systems, 1972 -- Collection of Works), 1972, p 34 (from Referativnyy Zhurnal -- Aviatsionnyye i Raketnyye Dvigateli, No 1, 1973, Abstract No 1.34.145 Resume)

Translation: On the basis of a phenomenological model of unsteady combustion, the authors discuss the process of the interaction of burning gunpowder with the acoustic field, in the case where the products behind the flame are capable of reversible chemical reactions. It is found that the presence of chemically active combustion products behind the flame front exerts an effect, in the first place, upon the decrease of sound velocity in comparison with the sound velocity in a chemically "frozen" medium, and secondly, upon a decrease of the coefficient of reflection of the pressure waves from the combustion zone.

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USSR

UDC 536.46

ROMADONOVA, L. D., MAL'TSEV, V. M., and POKHIL, P. F.

"Influence of the Physicochemical Properties of the Fuel and the Oxidant Upon the Nature of the Relationship of the Combustion Rate of a Fuel Mixture to the Particle Size of the Fuel"

Novosibirsk, Fizika Goreniya i Vzryva, No 1, 1972, pp 8-15

Abstract: In order to trace the influence of the physicochemical properties of the fuel and the oxidant upon the nature of the relationship of the combustion rate of a fuel mixture to the particle size of the fuel, stoichiometric compositions were investigated on the basis of three oxidants and 28 fuels. It is shown that in the case of a fusible oxidant and a nonsublimable fuel, the combustion rate of a composition with a fuel of large particle size is higher than the combustion rate of a composition with fine fuel particles. 2 figures. 3 tables. 8 references.

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USSR

UDC 536.46+669.715

BREYTER, A. L., KASHPOROV, L. Ya., MAL'TSEV, V. M., POKHIL, P. F., POPOV, Ye. I., PEPEKIN, V. I., and STASENKO, A. G., Moscow

"Burning of Single Particles of Aluminum-Magnesium Alloys in the Flame of Oxidizer-Fuel Mixture"

Novosibirsk, Fizika Goreniya i Vzryva, Vol 7, No 2, Jun 71, pp 222—227

Abstract : The burning of single particles of aluminum-magnesium alloys in the tongue of the flame of a mixture of ammonium perchlorate and urotropine of stoichiometric composition ( 88 % ammonium perchlorate and 12 % urotropine ) was experimentally investigated. The investigation results are discussed by reference to photographs of typical tracks of burning particles and diagrams showing the dependences of the inflammation time lag and the particle fraction subjected to explosive burning on particle composition. From the viewpoint of complete burning by modified fuel on aluminum base, alloys with 30—45 % aluminum and 55—70 %

USSR

BREYTER, A. L., KASHPOROV, L. Ya.,el al., Fizika Goreniya i Vzryva, Vol 7, No 2, Jun 71, pp 222-227

magnesium are considered to be effective. The characteristics of burning of the metal component are determined by the nature of included metals: the permeability of its oxidic layers, reaction capability, surface activity, volatility, fusing temperature, density change by fusing, and the burning temperature. Five illustr., one table, 16 biblio. refs.

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USSR UDC 536.46

GOSTINTSEV, Yu. A., SUKHANOV, L. A., POKHIL, P. F., Moscow

"The Theory of Unstable Combustion of a Powder. Stability of Processes in a Semi-Closed Volume"

Zhurnal Prikladnoy Mekhaniki i Tekhnicheskoy Fiziki, No 6, 1971, pp 65-73.

ABSTRACT: Based on the phenomenological theory of unstable combustion, equations are produced describing processes during combustion of a powder in a semi-closed volume. The solution of these equations is found with slight changes in critical nozzle cross section. The stability of the processes within the chamber is studied.

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USSR UDC 536.46

GOSMINTSEV, Yu. A., SUKHANOV, L. A., POKHIL, P. F., Moscow

"The Theory of Unstable Combustion of Powder. Combustion with Harmonically Changing Pressure"

Zhurnal Prikladnoy Mekhaniki i Tekhnicheskoy Fiziki, No 5, 1971, pp 60-69.

ABSTRACT: It is demonstrated that in order to construct a theory of the unstable burning of a powder, it is necessary to know the stable depepdences of combustion rate $u_0^\circ$, surface temperature $T_s^\circ$ and flame temperature $T_F$ on external parameters and initial powder temperature. Processes of combustion in an unlimited volume are studied within the framework of the theory, when one of the external parameters changes harmonically.

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USSR

UDC 541.126

GOSTINTSEV, YU. A., YERMOLAYEV, B. S., and POKHIL, P. F.

"The Powder (Solid-Propellant) Engine as a Homogeneous Chemical Reactor"

Moscow, Doklady Akademii Nauk SSSR, Vol 199, No 5, 11 Aug 71, pp 1118-1121

Abstract: Earlier approaches to problems of variable combustion of powder in rocket engines have been based on the assumption that the chemical reactions involved proceed within a narrow zone of high-temperature flame. This would mean that the flame temperature depends upon internal engine pressure as well as upon the temperature gradient in the powder condensation phase. However, in a great many cases (such as in the presence of sharp pressure drop in the chamber) the flame temperature may fall so low that the characteristic chemical reaction time $t_{chem}$ will be of the same order as the gas residence time $t_{eng}$. For such cases, therefore, any model based on the notion of a narrow flame zone is contrary to reality.

To avoid such errors, the authors derived a series of equations to represent gas state, thermal conductivity in the condensation phase, and thermal balance and pyrolysis products in that phase, as well as some other factors.



APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002202510001-8"

USSR

GOSTINTSEV, YU. A., et al., Doklady Akademii Nauk SSSR, Vol 199, No 5, 11 Aug 71, pp 1118-1121

These equations afford a description of all known states encountered when the ratio $t_{chem}/t_{eng}$ is on the order of 1. Such states would include extinction, steady flameless combustion, auto oscillation in the chemical reactor, and repeated ignition -- all very probably encountered in connection with chamber pressure drop.

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Combustion

USSR

UDC 541:124-137

LOGACHEV, V. S., DMITRIYEV, A. S., and POKHIL, P. F., Institute for Physical Chemistry, Academy of Sciences, USSR, Moscow

"Combustion Mechanism for Ammonium Perchlorate"

Moscow, Doklady Akademii Nauk SSSR, Vol 205, No 2, 1972, pp 400-403

Abstract: The mechanism is examined for the generation of the ionization zone during the combustion of ammonium perchlorate (APC) and equations derived quantitatively relating the kinetics with events occurring in the condensed phase and gas phase during the decomposition. The monomolecular reaction rate follows the equation

$$un_1 = \int_0^{\infty} n_0 Z_1 \exp-(E_1/kT)dx$$

where u is the rate of combustion; $n_0$ and $n_1$ are the number of APC molecules and the number of defects per $cm^3$, E is the activation energy; and $Z_1$ is the

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LOGACHEV, V. S., et al., Doklady Akademii Nauk SSSR, Vol 205, No 2, 1972, pp 400-403

preexponential factor. Combining this equation with a similar one for bimolecular reactions, and expressing $E_1$ (and the corresponding $E_2$ ) and $n_1$ in terms of the physical constants of the system and experimental conditions, an equation is obtained which expresses u entirely in terms of physical and thermodynamic variables. From this equation it can be seen that the governing factors are the physical and chemical processes occurring in the condensed phase of the crystal.

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UDC 662.222

USSR

LOGACHEV, V. S., DMITRIYEV, A. S., and POKHIL, P. F. (Moscow)

"On the Mechanism of Ammonium Perchlorate Combustion"

Novosibirsk, Fizika Goreniya i Vzryva, Vol 8, No 2, Jun 72, pp 236-247

Abstract: The article attempts to elucidate the mechanism for the appearance of an ionization zone in the combustion of ammonium perchlorate, as well as to establish quantitative relations between kinetic regularities taking place in the condensed and gaseous phase during the decomposition (combustion) of inorganic oxidizers. For this purpose measurements were taken of the electric conductivity of the condensed phase during the combustion of ammonium perchlorate. Experiments were staged in a nitrogen atmosphere in the pressure range of 200 mm Hg — 100 atm. The charges were made of two square-shaped tablets, between which were tungsten-rhenium wire probes. The potential difference fed to the probes varied from 0 to 50 v according to the conditions of the experiment. At the same time the flame temperature was measured by a thermocouple at the site of the probes, with the probes themselves being used as thermocouples at the same time in individual experiments, while the combustion rate could be judged from pressure variations in the bomb.

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USSR

LOGACHEV, V. S., et al., Fizika Goreniya i Vzryva, Vol 8, No 2, Jun 72, pp 236-247

The following three important results were noted in the experiments:

1. The activation energy of ammonium perchlorate decomposition grows as the temperature in the heating-up zone (Michelson layer) of the ammonium perchlorate grows.

2. A potential difference appears in the reaction zone.

3. The gas directly next to the burning surface of ammonium perchlorate is in the plasma state.

The following combustion mechanism is possible:

1. In the heating-up zone of the condensed phase, negative and positive ion defects are formed, resulting in a space charge with high conductivity in the reaction layer of ammonium perchlorate.

2/3

USSR

UDC: 536.46:533.6

FROLOV, Yu. V., KOROTKOV, A. I., LEYPUNSKIY, O. I., POKHIL, P. F.

"Burning of Aluminum in the Composition of Heterogeneous Condensed Systems"

V sb. Fiz. Aerodispersn. sistem. Vyp. 3 (Physics of Aerodisperse Systems —collection of works, No 3), Kiev, Kiev University, 1970, pp 126-137 (from RZh-Mekhanika, No 7, Jul 71, Abstract No 7B805)

Translation: A brief survey is presented of previously completed works on burning of aluminum. Work on studying burning of the metal and the principles which govern burning of metallized heterogeneous condensed compositions is done on a semiclosed installation and in a constant-pressure device. The pressure interval is 10-100 atmospheres. The authors consider the effect which various factors (pressure, agglomeration, etc.) have on burning of aluminum in a composition of condensed systems. An experimental formula is derived for determining the time of burning of aluminum particles $\tau_b = 0.67d^{1.5}/a_c^{0.9}$, where $d$ is the diameter of the particles in microns; $a_c$ is the relative concentration of oxygen-containing active compounds $H_2O+CO_2$ in percent. Bibliography of thirteen titles. Authors' abstract.

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UDC 533.601.1:533.607.11

USSR

GOSTINTSEV, YU. A., IL'YUKHIN, V. S., POKHIL, P. F., Moscow. Institute of Chemical Physics, Academy of Sciences, USSR

"The Zone of Reverse Flow in Rapidly Rotating Gas Streams and Jets"

Minsk, Inzhererno-Fizicheskiy Zhurnal, No. 6, 1971, pp 1036-1041

Abstract: In the article are presented the results of an experimental investigation of the near-axial zone of reverse flows of a rotating supersonic underexpanded jet and a helical flow of gas in the diffuser part of the nozzle. With the flow of a rotating stream of gas in the supersonic diffuser part of the nozzle, a zone of reverse currents can form in the vicinity of the axis, just as in the case of a free twisted jet. The origination of such a zone brings about the appearance of a complex pattern of interaction of the shocks in the nozzle, which affect the separation of the stream from the walls and which affects the traction characteristics of the nozzle. 5 figures, 6 bibliographic entries.

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UDC 536.46

USSR

POKHIL, P. F., LOGACHEV, V. S., MAL'TSEV, V. M., SELEZNEV, V. A.

"Spectral and Photometric Research on the Flame Jet in Model Fuel-Oxidizer-Metal Systems"

Novosibirsk, Fizika Goreniya i Vzryva, No 2, June 1970, pp 143-152

Abstract: The equipment used for spectral research on the flame jet in the combustion of fuel-oxidizer-metal systems is described, and its operation is explained. Spectral flame-jet research by means of this installation permitted the photometric method to be used for temperature measurement; this method permitted the shape of the flame of individual metal particles in the combustion products of the charge to be locally determined. Evaluation of the combustion temperature of aluminum and magnesium particles in the flame jet of model systems by the spectral and the photometric method is discussed.

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UNCLASSIFIED PROCESSING DATE--13NOV70

1/2 020

TITLE--INITIAL TEMPERATURE DEPENDENCE OF THE THICKNESS OF AN UNBURNED POWDER LAYER ON A METAL PLATE -U-

AUTHOR-(04)-NEFEDOVA, O.I., NOVIKOV, S.S., POKHIL, P.F., RYAZANTSEV, YU.S.

COUNTRY OF INFO--USSR

SOURCE--PMTF, ZHURNAL PRIKLADNOI MEKHANIKI I TEKHICHESKOI FIZIKI, MAR.-APR. 1970, P. 85-89

DATE PUBLISHED-------70

SUBJECT AREAS--PROPULSION AND FUELS

TOPIC TAGS--COMBUSTION R AND D, POWDER COMBUSTION, MATHEMATIC EXPRESSION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3005/1966 STEP NO--UR/0207/70/000/000/0085/0089

CIRC ACCESSION NO--AP0133810

UNCLASSIFIED

2/2 020 UNCLASSIFIED PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AP0133810

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. DISCUSSION OF CERTAIN FINDINGS REGARDING THE DEPENDENCE OF THE THICKNESS OF AN UNBURNED POWDER LAYER ON THE INITITAL TEMPERATURE. THE POSSIBILITY OF AN APPROXIMATE CALCULATION OF THE UNSTEADY PROCESSES ACCOMPANYING THE APPROACH OF A COMBUSTION WAVE TO THE PLANE OF CONTACT BETWEEN THE POWDER AND THE METAL IS CONSIDERED. SOME THEORETICAL AND EXPERIMENTAL FINDINGS ARE COMPARED.

UNCLASSIFIED

UNCLASSIFIED PROCESSING DATE--04DEC70

1/2 049

TITLE--INVESTIGATION OF METAL PARTICLE FUSION DURING THE COMBUSTION OF METALLIZED BALLISTITE COMPOSITIONS AND FUEL OXIDIZER MIXTURES -U-

AUTHOR-(03)-POKHIL, P.F., LOGACHEV, V.S., MALTSEV, V.M.

COUNTRY OF INFO--USSR

SOURCE--FIZIKA GORENIIA I VZRYVA, VOL. 6, AR. 1970, P. 80-92

DATE PUBLISHED----MAR70

SUBJECT AREAS--PROPULSION AND FUELS

TOPIC TAGS--AMMONIUM PERCHLORATE, POTASSIUM PERCHLORATE, COMBUSTION RATE, FORMALDEHYDE, COMBUSTION PRODUCT, SOLID PROPELLANT COMBUSTION, ALUMINUM POWDER

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY FICHE NO----FD70/605107/E12 STEP NO--UR/0414/70/006/000/0080/0092

CIRC ACCESSION NO--AP0140763

UNCLASSIFIED

2/2 049 UNCLASSIFIED PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0140763

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. PHOTOGRAPHIC AND MICROSCOPIC STUDY OF THE FUSTION OF METALLIC PARTICLES DURING THE COMBUSTION OF STOICHIOMETRIC MIXTURES OF AMMONIUM AND POTASSIUM PERCHLORATE AND POLYFORMALDEHYDE WITH ADDITIONS OF 7, 13, OR 20PERCENT ALUMINUM PARTICLES OF VARIOUS SIZES AND GEOMETRIES. SPECIAL TECHNIQUES WERE USED FOR SAMPLING THE CONDENSED PHASE OF THE SMOKE GAS MIXTURES AT VARIOUS DISTANCES FROM THE BURNING CHARGE SURFACE. THE DEPENDENCE OF THE CHARACTERISTICS OF THE FUSION PROCESS ON THE VARIABLES OF THE COMBUSTION PROCESS IS DISCUSSED.

UNCLASSIFIED

1/2 040 UNCLASSIFIED PROCESSING DATE--04DEC70

TITLE--EFFECT OF THE ACTIVITY OF ALUMINUM AND MAGNESIUM POWDERS ON THE COMBUSTION OF COMPOSITIONS -U-

AUTHOR-(02)-ROMODANOVA, L.D., POKHIL, P.F.

COUNTRY OF INFO--USSR

SOURCE--FIZIKA GORENIIA I VZRYVA, VOL. 6, MAR. 1970, P. 126-128

DATE PUBLISHED----MAR70

SUBJECT AREAS--PROPULSION AND FUELS, MATERIALS

TOPIC TAGS--COMBUSTION RATE, AMMONIUM PERCHLORATE, ALUMINUM, MAGNESIUM, IRON OXIDE, VANADIUM OXIDE, PRESSURE EFFECT

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY FICHE NO----FD70/605017/F01 STEP NO--UR/0414/70/006/000/0126/0128

CIRC ACCESSION NO--AP0140766

UNCLASSIFIED

2/2 040 UNCLASSIFIED PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0140766

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. INVESTIGATION OF SELF IGNITION, AND COMBUSTION RATES VS PRESSURE AND ACTIVITY, IN MIXTURES OF AMMONIUM PERCHLORATE WITH ALUMINUM AND MAGNESIUM COMPRESSED TO MAXIMUM DENSITIES AND HAVING ACTIVITIES OF 99, 80, 60, 40, OR 20PERCENT. IT IS FOUND THAT THE ACTIVITY LEVEL OF THE MIXTURE HAS NO APPRECIABLE EFFECT ON THE PRESSURE DEPENDENT COMBUSTION RATES AT PRESSURES RANGING FROM 1 TO 120 KGF-SQ CM. THE STIMULATING EFFECTS OF FERRIC AND VANADIUM OXIDE ADDITIONS ON THE COMBUSTION PROCESS ARE DISCUSSED.

UNCLASSIFIED

1/2 053 UNCLASSIFIED PROCESSING DATE--30OCT70

TITLE--MEASUREMENT OF THE ACOUSTIC CONDUCTIVITY OF A BURNING SOLID PROPELLANT SURFACE -U-

AUTHOR-(04)-MARGOLIN, A.D., SVETLICHNYI, I.B., POKHIL, P.F., TSIRULNIKOV, A.S.

COUNTRY OF INFO--USSR

SOURCE--PMTF ZHURNAL PRIKLADNOI MEKHANIKI I TEKHNICHESKOI FIZIKI, JAN.-FEB. 1970, P. 149-155

DATE PUBLISHED--------70

SUBJECT AREAS--PROPULSION AND FUELS, PHYSICS

TOPIC TAGS--SOLID PROPELLANT, MEASUREMENT, SURFACE PROPERTY, ACOUSTIC MEASUREMENT, PROPELLANT BURNING RATE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1996/1543 STEP NO--UR/0207/70/000/000/0149/0155

CIRC ACCESSION NO--AP0118526

UNCLASSIFIED

2/2 053 UNCLASSIFIED PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0118526

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. DEVELOPMENT AND APPLICATION OF TWO METHODS OF MEASURING THE ACOUSTIC CONDUCTIVITY OF A BURNING SOLID PROPELLANT SURFACE NAMELY, THE METHOD OF CRITICAL CONDITIONS AND THE VARIABLE SURFACE METHOD. THE METHOD OF CRITICAL CONDITIONS IS BASED ON MEASURING THE LIMIT OF SELF EXCITATION OF UNSTABLE COMBUSTION IN RESONATORS OF SIMPLE SHAPE THE ACOUSTIC LOSSES OF WHICH ARE RELIABLY CALCULATED. THE VARIABLE SURFACE METHOD CONSISTS IN MEASURING THE RATE OF INCREASE OR DECREASE IN THE AMPLITUDE OF THE OSCILLATIONS IN A T CHAMBER DURING COMBUSTION OF A SPECIMEN OF SOLID PROPELLANT WITH A BURNING SURFACE THE AREA OF WHICH VARIES IN TIME.

UNCLASSIFIED

1/2 033 UNCLASSIFIED PROCESSING DATE--18SEP70

TITLE--MECHANISM OF EROSION COMBUSION OF GUNPOWDER -U-

AUTHOR-(02)-GOSTINTSEV, YU.A., POKHIL, P.V.

COUNTRY OF INFO--USSR

SOURCE--MOSCOW, DOKLADY AKADEMII NAUK SSSR, VOL 190, NO 1, 1970, PP 138-139

DATE PUBLISHED-------70

SUBJECT AREAS--ORDNANCE, PROPULSION AND FUELS

TOPIC TAGS--SOLID GUN PROPELLANT, EROSION, POWDER COMBUSTION, COMBUSTION MECHANISM, BLACK POWDER

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1986/1090 STEP NO--UR/0020/70/190/001/0138/0139

CIRC ACCESSION NO--AT0103010

UNCLASSIFIED

UNCLASSIFIED PROCESSING DATE--18SEP70

2/2 033

CIRC ACCESSION NO--AT0103010

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. TWO MECHANISMS OF EROSION COMBUSTION OF GUNPOWDER ARE COMPARED. THE HYPOTHESIS OF THE THERMAL MECHANISM OF EROSION COMBUSTION IS PRESENTED, IN WHICH TURBULENCE OF THE COMBUSTION ZONE OVER THE DECOMPOSING SURFACE LEADS TO INCREASED RATE OF COMBUSTION OF THE GASEOUS INTERMEDIATES. THE THEORETICAL TREATMENT OF THIS MECHANISM IS ESSENTIALLY AN EXAMINATION OF HEAT REMOVAL FROM THE FLAME ZONE TO THE GUNPOWDER. THE SECOND MECHANISM OF EROSION COMBUSION OF GUNPOWDER CONSISTS OF THE FOLLOWING. THE HEATED SURFACE OF THE GUNPOWDER, DUE TO DISPERSION, FOAMING, BOILING, AND SO ON OCCURRING IN THE HEATED ZONE OF THE K PHASE, IS ALWAYS UNEVEN AND THE FLOW IN THE TUBE PAST THE GUNPOWDER BEGINS TO 'TAKE NOTE' OF THE ROUGHNESSES, AT WHICH THE REYNOLDS NUMBER FOR THE ROUGHNESS ELEMENT ATTAINS A VALUE SUFFICING TO SUPPORT EROSION COMBUSTION WHEN THE THICKNESS OF THE VISCOUS SUBLAYER IN THE GAS BECOMES COMPARABLE WITH THE HEAT OF THE ROUGHNESS ELEMENTS ON THE HEATED SURFACE.

UNCLASSIFIED

USSR

UDC: 536.45

POKHIL, P. F., LOGACHEV, V. S., MAL'TSEV, V. M.

"Study of Fusion of Metal Particles During Combusion of Metallized Ballistite Compositions and Fuel-Oxidizer Mixtures"

Novosibirsk, Fizika Goreniya i Vzryva, No. 6, March 1970, pp 80-92

Abstract: Experimental data have indicated that the mechanism of combustion of ballistite compositions does not change with the addition of aluminum. An investigation of the size, form and state of particle surfaces before and after combustion of ballistite compositions at various pressures was performed in order to gain an idea of the mechanism of combustion of the aluminum particles added. Photographs of particles during the process of combustion are presented. As the ballistite compositions plus aluminum burn, the particles of metal adhere to the thermostable products of decomposition of the nitrocellulose, then fuse near the surface of the charge. During combustion of fuel-oxidizer-metal compositions, fusion of the metal particles occurs on the surface of the charge, since the charge temperature is sufficient to melt the aluminum and magnesium. As the percent of metal in the composition is increased, the mean particle diameter of aluminum and magnesium particles formed as a result of fusion on the charge surface also increases. The degree of fusion of metal

USSR

POKHIL, P. F., LOGACHEV, V. S., MAL'TSEV, V. M., Novosibirsk, Fizika Goreniya i Vzryva, No. 6, March 1970, pp 80-92

particles on the charge surface increases with decreasing size of the initial particles of metal in the model composition. The mean volumetric size of particles of aluminum and magnesium formed as a result of fusion on the charge surface decreases with increasing combustion rate of the charge. The velocity of particles of aluminum and magnesium formed as a result of fusion on the hot surface of the model mixture is 2-3 mm/sec for aluminum and 4-5 mm/sec for magnesium.

USSR

UDC 536.46+662.32

FROLOV, YU. V., POKHIL, P. F., and LOGACHEV, V. S. (Moscow)

"Inflammation and Combustion of Powdered Aluminum in High-Temperature Gaseous Media and the Composition of Heterogeneous Condensed Systems"

Novosibirsk, Fizika Goreniya i Vzryva, Vol 8, No 2, Jun 72, pp 213-236

Abstract: The article gives a brief survey of Soviet scientific studies published in the last three or four years on peculiarities of the mechanism for the inflammation and combustion of metal particles (especially aluminum) and the effect of the latter on the combustion of condensed systems. The following areas are covered:

1. The study of the process of the inflammation and combustion of individual metal particles in a high-temperature gaseous oxidizing medium.

2. The study of peculiarities of the mechanism for the combustion and inflammation of powdered metal particles in the combustion products of condensed fuel-oxidizer systems.

USSR

FROLOV, YU. V., et al., Fizika Goreniya i Vzryva, Vol 8, No 2, Jun 72, pp 213-236

3. The study of the principal regularities in the enlargement (agglomeration) of powdered metal particles on (or near) the burning surface of ballistic or mixture powders with increased concentration (up to 25 percent) of the metallic additive.

4. Detection of the principal directions of the effect of powdered metals on the combustion rate of mixture condensed fuel-oxidizer systems.

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USSR UDC:536.468+662.215.1

ROMODANOVA, L. D., POKHIL, P. F., Moscow

"Mechanism of Influence of Silicon Dioxide on Combustion Rate of Compositions"

Novosibirsk, Fizika Goreniya i Vzryva, Vol. 6, No. 3, Sep 70, pp. 285-290

Abstract: This work presents a study of the mechanism of the influence of $SiO_2$ on the combustion rate of a stoichiometric composition of $NH_4ClO_4$+Al and the same composition with a polyoxymethylene binder. The experiments were performed in a constant pressure bomb under nitrogen pressure, and the combustion rate was recorded photographically. Addition of $SiO_2$ 1% of the composition not only increases the combustion rate but also changes the nature of the dependence of combustion rate on pressure. The higher the pressure, the stronger the influence of the dioxide. The experiments indicate that the influence of silicon dioxide results from a breakdown of the oxide film on the aluminum, creating favorable conditions for penetration of oxygen to the metal. Addition of silicon dioxide to the composition with

USSR

UDC:536.468+662.215.1

ROMODANOVA, L. D., POKHIL, P. F., Novosibirsk, Fizika Goreniya i Vzryva, Vol. 6, No. 3, Sep 70, pp. 285-290

the polyoxymethylene binder results in almost no increase in combustion rate in the high pressure area, and decreases combustion rate in the low pressure area.

USSR UDC:536.468+662.311.1

KRASNOV, Yu. K., MARGULIS, V. M., MARGOLIN, A. D., POKHIL, P. F., Moscow

"Rate of Penetration of Combustion Into the Pores of a Charge of Explosives"

Novosibirsk, Fizika Goreniya i Vzryva, Vol. 6, No. 3, Sep 70, pp. 290-295

Abstract: Under certain conditions, porous explosives burn at very high speeds, resulting from the fact that the hot combustion products preceding the normal combustion front penetrate into the pores of the charge and heat them. The critical conditions of penetration of burning into pores have been studied earlier. This work studies the question of the rate of penetration of combustion into the pores of an explosive charge. The experimental study was performed by placing cylindrical specimens of ballistic powder 40 mm in length with channels 1, 1.5, 2.5 and 4 mm in diameter and wall thicknesses of 0.5-1.5 mm in a constant pressure bomb. As the powder burned, the level of fluid filling the pore dropped as the fluid was forced out of the pore through a thin connecting tube to the space outside the bomb. The experiments revealed that the rate of heating of the wall of the powder channel was not equal to the rate of penetration of combustion

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USSR UDC:536.468+662.311.1

KRASNOV, Yu. K., MARGULIS, V. M., MARGOLIN, A. D., POKHIL, P. F., Novosibirsk, Fizika Goreniya i Vzryva, Vol. 6, No. 3, Sep 70, pp. 290-295

products into the channel. The heating process lagged behind penetration of the combustion products. Expressions produced to describe the rates of movement indicate that the relationship between the rates of gas movement and ignition front is independent of the rate of penetration of combustion products into the channel. In the case of ignition of a smooth wall, the rate of propagation of the ignition front is independent of channel diameter.

UDC 541.126

USSR

GOSTINTSEV, Yu. A., POKHIL, P. F., and SUKHANOV, L. A.

"Complete System of Equations for Nonstationary Processes of Gunpowder Ignition in a Half-Closed Space"

Moscow, Doklady Akademii Nauk SSSR, Vol 195, No 1, 1970, pp 137-139

Abstract: A novel approach is used to study the problem of powder burning in a semi-enclosed space. The article considers two theoretical effects: the first, the nonadiabatic nature of the nonstationary flame front, connected with the time-variable heat flow from the flame to the condensation phase of the powder; second, the incompleteness of the chemical reactions inherent in the burning of condensed material in a steady-state mode at low pressure and in the burning of the material in a nonstationary mode at high temperature gradients on the surface. To formulate the problem, a model of powder ignition was used with variable temperature of the heated surface and with a quasi-stationary gas phase and chemical reaction zone in the condensation phase. The authors are connected with the Institute of Chemical Physics, Academy of Sciences USSR, Moscow.

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USSR

UDC 662.1.4

GOSTINTSEV, Yu. A., and POKHIL, P. F.

"Mechanism of Erosive Powder Combustion"

Dokl. AN SSSR (Proceedings of USSR Academy of Sciences), 1970, 190, No 1, pp 138-139 (from RZh-Khimiya, No 11 (II), 10 Jun 70, Abstract No 11N1082 by authors)

Translation: The authors suggest a new thermal mechanism of erosive powder combustion, which appears when the thickness of the viscous sublayer in the gas becomes comparable to the height of the roughness elements on the burning surface. Moreover, an increase in the combustion rate occurs not only due to the high intensity of heat transfer from the gas to the condensed-phase ("inflation"), but also due to mechanical entrainment of part of the heated layer ("deflation"). The critical value of parameter $A = \rho V/\rho_s U_s \sqrt{\lambda} \approx 5.5 - 8.2$, determining the moment at which erosion appears, predicted on the basis of this mechanism, coincides well with the value $A \simeq 7 - 8.0$ observed experimentally.

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UDC:662.215.2

USSR

POKHIL, P. F., LOGACHEV, V. S., MAL'TSEV, V. M., Moscow

"Mechanism of Combustion of Metal Particles"

Novosibirsk, Fizika Goreniya i Vzryva, Vol. 6, No. 3, Sep 70, pp. 407-410

Abstract: This article is dedicated to investigation of the combustion of condensed systems containing such metals as aluminum, magnesium and their alloys as additives. The experimental study was performed using cylindrical specimens 5 mm in diameter and 7-10 mm high. It was established that ballistite burns stably with preliminary heating to a minimum temperature of 110°C, while an ammonium perchlorate composition must be heated to a minimum temperature of 200°C. Studies were made of the thermal effect of the summary exothermic process in the reaction layer of the condensed phase. The results indicate that in the area of flameless combustion of ballistite compositions with aluminum the surface temperature of flameless combustion is 300°C, that is on the same order as for

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UDC:662.215.2

USSR

POKHIL, P. F., LOGACHEV, V. S., MAL'TSEV, V. M., Novosibirsk, Fizika Goreniya i Vzryva, Vol. 6, No. 3, Sep 70, pp. 407-410

ballistite compositions without the metal. This indicates that the aluminum particles burn in the smoke-gas zone of the flame near the surface rather than on the surface of the condensed material. High-speed cinematography indicated that the rate of combustion of aluminum particles is an order of magnitude less than the rate of combustion of the ballistite composition, and increases with increasing surrounding medium temperature.

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UDC: 534.

USSR

SVETLICHNYY, I. B., MARGOLIN, A. D., KUZNETSOV, A. A., POKHIL, P. F., MYSOV, V. G.

"Direct Method of Measuring the Acoustic Conduction of the Burning Surface of Powder"

Fiz. aerodispers. sistem. Mezhved. nauch. sb. (Physics of Aerodisperse Systems. Interdepartmental Scientific Collection), 1971, vyp. 4, pp 84-92 (from RZh-Fizika, No 6, Jun 72, Abstract No 6Zh524)

Translation: A direct method is developed for measuring acoustic conductivity of a burning surface as the ratio of the change in the velocity of outflow of combustion products from the surface to the pressure in the acoustic wave at the burning surface. The pressure is measured by a piezoelectric transducer, and the acoustic velocity at the burning surface is determined by an electromagnetic flowmeter system with transverse magnetic field in a tube of circular cross section with insulated walls. The high--temperature ionized products of gunpowder combustion acted as the conducting medium. The test specimen of powder was placed in the tube together with a noise emitter which generated plane longitudinal waves. Measurements

USSR

SVETLICHNYY, I. B. et al., Fiz. aerodispers. sistem Mezhved. nauch. sb., 1971, vyp. 4, pp 84-92

could be made both at fixed and variable pressures and signal frequencies. A theory of the method is developed, and a theoretical analysis and experimental study are made of the effect of various factors on measurement results. The dimensionless acoustic conduction of the burning surface of nitroglycerin powders is measured, and satisfactory agreement with the results of measurements by other methods is obtained. Authors' abstract.

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USSR

UDC 547.944/945 + 541.133

UDOVIKO, YE. A., POKHMELKINA, S. A., and PETRENKO, V. V., Zaporozhe State Medical Institute

"Electrochemical Extraction of Tropan Alkaloids From the Plant Material"

Tashkent, Khimiya Prirodnykh Soyedineniy, No 3, 1972, pp 334-336

Abstract: Electrochemical method was used for isolation of tropane group of alkaloids from Altropa Belladonna (Z.), Datura Stramonium (Z.), and Scopolia Carniolica (obreru). During electrolysis of these extracts tropane alkaloids accumulate in the liquid around the cathode, the area becomes alkaline, the pH changing from 6 to 11, retarding the accumulation of alkaloids. Therefore the medium has to be acidified, to get complete extraction. No accumulation of the alkaloid is observed in the liquid around the cathode without the application of current (by dialysis alone). The alkaloid content in the cathode liquid depends on the duration of the electrolysis - increasing with time - and is inversely proportional to current density; the optimal current densities for the process are rather low, ranging from 10 to 30 $a/m^2$.

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Acc. Nr. AP0048836 Abstracting Service: CHEMICAL ABST. 5-70 Ref. Code UR0459

90905n **Initiating action of some unsaturated peroxides during styrene polymerization in bulk.** Puchin, V. A.; Polkhmur-shova, M. V.; Yurzhenko, T. I.; Krut, A. V. (Lvov. Politekh. Inst., Lvov, USSR). *Vysokomol. Soedin., Ser. A* 1970, 12(1), 248-51 (Russ). The initiating action of several unsatd. peresters during bulk polymn. of styrene was compared with that of their satd. analogs. Peresters studied were *tert*-Bu peracrylate (I), *tert*-Bu perpropionate (II), *tert*-Bu permethacrylate, *tert*-Bu perisobutyrate, *tert*-Bu percrotonate (III), and 2-(vinylethynyl)-2-propyl hydroperoxide (IV). The initiating action was detd. from the rate of polymn. of styrene dilatometers at initiator concn. 0.00565, 0.0281, and 0.0556 mole/l. and 70-90°. The d.p. varied linearly with time (at 20-3% conversion). The unsatd. peresters had greater initiating action than their satd. analogs. Thus, after 2 hr the conversion was 19.3% with I compared with 11.0% with II. The initiating action of IV was intermediate between that of I and III. The unsatd. peresters had lower activation energies (14.5-15 kcal/mole) than their satd. analogs (19.0-23.2 kcal/mole). The mol. wt. of the polystyrenes obtained was inversely proportional to the perester (both satd. and unsatd.) concn., apparently due to intensification of breaking of the growing polymer chains. The unsatd. peresters initiated polymn. of vinyl monomers at comparatively low temps. and gave branched polymers. DBJR

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REEL/FRAME
19800603

USSR

UDC 621.793.6:669.292:620.198

POKHMURSKIY, V. I., TOLSTOVA, S. V., and MOKROVA, A. M., Physico-Mechanical Institute, Academy of Sciences Ukrainian SSR, L'vov, and the Tula Pedagogical Institute

"Effect of a Steel's Chemical Composition on Structure of Vanadized Layers"

Kiev, Fiziko-Khimicheskaya Mekhanika Materialov, Vol 9, No 6, 1973, pp 16 19

Abstract: Low-, medium-, and high-carbon steels and stainless steels were vanadium coated from which it was found that Fe and V form a continuous series of substitutional solid solutions and the thickness of the diffusion layer was 10-18 microns for the carbon steels, 22-25 microns in steel Kh17N2, 70 microns in Kh18N10T, and 200 microns in steel 2Kh13. The microhardness of the diffusion layer was hardest for the carbon steels, ranging from 1100 to 2800 while steels Kh17N2, Kh18N10T, and 2Kh13 had values of 2000, 800-300, and 200 respectively. The microhardness of steel Kh17N2 with the vanadium coating was lower than that of the base metal and no carbide zone was found. This was explained by the increased concentration of carbide-forming elements which bonded the carbon into carbides as a result of which an alpha-solid solution of 1/2